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DEPUTY ADMINISTRATOR

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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GOOD AFTERNOON, LADIES AND GENTLEMEN. IT IS A PLEASURE TO BE WITH YOU TODAY AND TO HAVE THE OPPORTUNITY TO TALK WITH SUCH KNOWLEDGEABLE PEOPLE ABOUT THE GOVERNMENT/INDUSTRY AEROSPACE TEAM, ITS ACCOMPLISHMENTS, ITS STANDING IN AN INCREASINGLY COMPETITIVE WORLD MARKET, AND ITS CONTRIBUTIONS TO THE ECONOMIC WELFARE OF OUR COUNTRY.

I THINK YOU WILL UNDERSTAND THAT I AM QUITE UNABLE TO RESIST MENTIONING, BY WAY OF AEROSPACE ACCOMPLISHMENT, THE RECENT TRIUMPHANT RETURN OF AMERICA'S SPACE TRANSPORTATION SYSTEM TO FULLY OPERATIONAL STATUS, WITH THE EFFECTIVELY FLAWLESS FLIGHT OF THE ORBITER DISCOVERY. THAT FLIGHT MARKED THE SUCCESSFUL CONCLUSION OF ONE OF THE LONGEST AND MOST DEMANDING DEVELOPMENT PROGRAMS WE HAVE EVER UNDERTAKEN, AND ONE ACCOMPLISHED IN THE FULL AND MERCILESS GLARE OF NATIONAL AND INTERNATIONAL PUBLICITY AT EVERY STEP. AND THE RESULT, A ROBUST AND RELIABLE SPACE SHUTTLE, STANDS AS A KEY FACTOR IN OUR FUTURE IN SPACE, ENABLING US TO FORGE AHEAD WITH THE INDISPENSABLE, PERMANENTLY MANNED FREEDOM SPACE STATION, AND TO CONDUCT A WIDE RANGE OF UNIQUE ACTIVITIES THAT BROADEN OUR KNOWLEDGE OF THE UNIVERSE, STRENGTHEN OUR COUNTRY'S TECHNOLOGICAL AND ECONOMIC BASE, AND ADDRESS THE MAJOR ENVIRONMENTAL ISSUES THREATENING PLANET EARTH.

BUT LET'S CONCENTRATE TODAY ON THE ECONOMIC IMPACT OF AEROSPACE ACTIVITIES WITH PARTICULAR ATTENTION TO NASA'S ROLE.

BACK IN THE MID-SEVENTIES, A STUDY WAS CONDUCTED ON THAT SUBJECT, THE ECONOMIC PAYBACK OF RESEARCH AND DEVELOPMENT, AND OF NASA'S ROLE IN THE NATION'S ECONOMIC AND TECHNOLOGICAL GROWTH. IT SHOWED A PAYBACK TO THE ECONOMY OF BETWEEN FIVE AND SEVEN DOLLARS FOR EVERY DOLLAR SPENT ON R AND D. WE HAVE BEEN WORKING ON UPDATING THAT STUDY; THE RESULTS SHOULD BE OUT VERY SOON; AND I AM CONFIDENT THEY WILL SHOW AN EVEN GREATER RETURN, PROBABLY ON THE ORDER OF EIGHT TO ONE.

WE KNOW THAT THERE IS WIDESPREAD AND GROWING COMMERCIAL AND PRIVATE SECTOR USE OF NASA-DEVELOPED TECHNOLOGY, PARTICULARLY IN THE FIELDS OF DIGITAL COMMUNICATIONS AND CIVIL AERONAUTICS PERFORMANCE AND EFFICIENCY.

THERE HAS BEEN DRAMATIC GROWTH IN THE USE OF DIGITALLY DEVELOPED ERROR CORRECTING CODES IN SUCH POPULAR CONSUMER AND BUSINESS PRODUCTS AS COMPACT DISK SYSTEMS (ALMOST \$2 BILLION THIS YEAR AND ESTIMATED AT \$2.6 BILLION IN 1990), AND HARD DISK DRIVES (\$5.2 BILLION THIS YEAR AND ESTIMATED AT \$6.3 IN 1990).

IN CIVIL AERONAUTICS THERE HAVE BEEN IMPORTANT GAINS FROM NASA TECHNOLOGY IN THE AREAS OF AERODYNAMIC DRAG REDUCTION, ADVANCED PROPULSION AND FLIGHT CONTROL SYSTEMS.

CANDIDATES FOR COMPARABLY SPREADING COMMERCIAL USE IN THE FUTURE MARKETPLACE, ARE NASA'S

SCANNING, TUNNELING ACCELEROMETER

COMPUTATIONAL FLUID DYNAMICS

TUNABLE SOLID STATE LASER

PROTEIN CRYSTAL GROWTH

HYBRID OPTICAL PROCESSING

THE ADVANCED TURBOPROP, AND

THE TILT ROTOR AIRCRAFT.

BUT THAT PROBABLE EIGHT-TO-ONE PAYBACK IS NOT THE ONLY BENEFIT THAT ACCRUES TO OUR COUNTRY FROM THE R AND D PERFORMED BY GOVERNMENT AND INDUSTRY. IT ALSO PROVIDES US WITH OUR NUMBER ONE EXPORT AND HELPS IMPORTANTLY TO KEEP THE BALANCE OF TRADE WITH OTHER NATIONS FROM GETTING TOO FAR OUT OF KILTER.

AEROSPACE PRODUCTS, LED BY ADVANCED CIVIL AIR TRANSPORTS, ARE NOW OUR PRIMARY EXPORT, EXCEEDING EVEN AGRICULTURE. FOR THE LAST NINE YEARS ENDING WITH 1987, OUR AEROSPACE FAVORABLE TRADE BALANCE WAS IN EXCESS OF TEN BILLION DOLLARS. AND THIS DESPITE THE EIGHT BILLION DOLLARS THAT THE FRENCH HAVE PAID TO AIRBUS TO TRY TO CATCH UP.

COMPETITION IS TOUGH AND STIFF. THE EUROPEANS ARE BUILDING FINE AIRCRAFT, AND WE READ THAT THE JAPANESE ARE DESIGNING A HYPERSONIC TRANSPORT, SO THAT PERHAPS THE "ORIENT EXPRESS" WILL BE FLYING WEST TO EAST. BUT WE ARE STAYING AHEAD. PEOPLE, ESPECIALLY THE MEDIA, WHICH NEARLY ALWAYS REFERS TO US AS "THE SPACE AGENCY", ARE INCLINED TO FORGET THAT THE FIRST "A" IN NASA STANDS FOR AERONAUTICS, AND WE ARE VERY PROUD OF THE WHAT WE ARE DOING IN THAT IMPORTANT FIELD. AT OUR AERONAUTICAL RESEARCH CENTERS, LANGLEY, LEWIS, AMES, AND DRYDEN, THE VERY BEST WORK IN THE WORLD IS BEING DONE IN DRAG REDUCTION, HIGH ANGLE OF ATTACK MANEUVERABILITY, PROPULSION, COMPUTATIONAL FLUID DYNAMICS, SUPERSONICS AND HYPERSONICS, TO NAME JUST A FEW AREAS.

OUT OF THAT WORK IN THE LOW SUPERSONIC RANGE WILL IN ALL PROBABILITY COME THE WORLD'S NEXT SUPERSONIC AIRLINER; RELATIVELY FUEL EFFICIENT, ENVIRONMENTALLY COMPATIBLE, AND REDUCING TRANS-PACIFIC FLYING TIMES BY SEVENTY TO EIGHTY PERCENT.

AND OUT OF NASA'S HYPERSONIC WIND TUNNELS AND COMPUTER SIMULATIONS, IN A JOINT EFFORT WITH THE DEPARTMENT OF DEFENSE, WILL COME THE NATIONAL AEROSPACE PLANE, THE FIRST TRANSATMOSPHERIC VEHICLE, WITH THE POTENTIAL OF DRASTICALLY CUTTING THE COSTS OF DELIVERING PAYLOADS TO ORBIT, AND OF PROVIDING SIGNIFICANT TECHNOLOGY RESEARCH THAT COULD LEAD, EARLY IN THE NEXT CENTURY, TO HYPERSONIC AIR TRAVEL.

ALL THIS OF COURSE INVOLVES BUSINESS. IN FACT APPROXIMATELY 85% OF NASA'S BUDGET GOES DIRECTLY TO THE PRIVATE SECTOR AND GENERATES JOBS FROM COAST TO COAST.

AND, AS YOU KNOW, FOR MANY YEARS THE PRIVATE SECTOR HAS BEEN PROFITABLY AND CONSTRUCTIVELY INVOLVED WITH US IN SPACE ACTIVITIES.

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BUT EARLY THIS YEAR, IN A MAJOR STATEMENT ON SPACE POLICY. THE PRESIDENT DIRECTED THE TRANSFER OF ALL PRACTICABLE GOVERNMENT ACTIVITIES TO THE PRIVATE SECTOR, AND CALLED FOR AGGRESSIVE EFFORTS BY FEDERAL AGENCIES TO DIRECT THE CREATIVE AND ENTREPRENEURIAL ENERGIES OF OUR FREE ENTERPRISE SYSTEM INTO SPACE ACTIVITIES FOR THE BENEFIT OF OUR NATIONAL ECONOMY AND THE LONG-RANGE IMPROVEMENT OF THE QUALITY OF LIFE OF OUR PEOPLE.

IN THE LAST FEW MINUTES OF MY TIME TODAY, LET ME GIVE YOU, AS BUSINESS PEOPLE, A BRIEF RUN-DOWN ON WHAT WE HAVE DONE, ARE DOING AND PLAN TO DO TO IMPLEMENT THAT POLICY.

LET'S START WITH THE MOST SUCCESSFUL GOVERNMENT/INDUSTRY SPACE PROGRAM OF ALL.

WAY BACK IN THE EARLY DAYS OF SPACEFARING, NASA WORKED WITH A, T AND T TO PROVIDE THE LAUNCH, ON A REIMBURSABLE BASIS, OF THE FIRST EXPERIMENTAL COMMUNICATIONS SATELLITE BUILT BY THE PRIVATE SECTOR. ITS NAME WILL RING A BELL. IT WAS TELSTAR.

NEXT NASA INITIATED A PROGRAM CALLED SYNCOM THAT DEVELOPED THE INFRASTRUCTURE NEEDED TO GO TO SYNCHRONOUS ORBIT, AND A SATELLITE WITH WHICH TO DEMONSTRATE WHAT COULD BE DONE IN THE WAY OF COMMUNICATIONS FROM THERE. AFTER THE COMSAT ACT OF 1963, COMSAT BOUGHT THE FOURTH SYNCOM SPACECRAFT, AND WE PUT IT IN SYNCHRONOUS ORBIT AS THE FIRST COMMERCIAL SATELLITE. ITS NAME WILL RING ANOTHER BELL. IT WAS EARLY BIRD

THUS, AS WAS THE CASE ALSO WITH THE RAILROAD AND INTERSTATE HIGHWAY SYSTEMS, THE GOVERNMENT ESTABLISHED THE NECESSARY INFRASTRUCTURE, DEMONSTRATED THE CAPABILITY, AND THE PRIVATE SECTOR CAME IN AND TOOK OVER, TO THE GREAT ECONOMIC ADVANTAGE OF THE NATION.

TODAY, OF COURSE, COMMUNICATIONS SATELLITES ARE A TWO BILLION-DOLLAR PER YEAR BUSINESS, PROVIDING THOUSANDS OF JOBS AND CONTRIBUTING ITS SHARE OF TAXES TO THE NATIONAL TREASURY--NOT TO MENTION BENEFITTING ALL OF US AS CONSUMERS WITH INSTANTANEOUS GLOBAL TELEPHONE AND TELEVISION SERVICES AT AFFORDABLE RATES.

CLEARLY, WHAT WE NEED AND ARE STRIVING FOR, ARE MORE PROGRAMS LIKE THIS--SUSTAINED, DYNAMIC, PRODUCTIVE, AND PROFITABLE.

ONE SUCH PROGRAM, ON WHICH WE HAVE BEEN WORKING FOR SEVERAL YEARS, AND THAT SHOWS EXCELLENT POTENTIAL, IS THE PRIVATIZATION OF EXPENDABLE LAUNCH VEHICLES.

RECENTLY WE CONCLUDED AN AGREEMENT WITH GENERAL DYNAMICS FOR THE PRIVATIZATION OF THE ATLAS CENTAUR VEHICLE. AND, WITH THE DEPARTMENT OF COMMERCE, WE AWARDED THAT FIRM A MULTI-YEAR CONTRACT TO PROVIDE ATLAS CENTAUR LAUNCH TRANSPORTATION SERVICES FOR THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION'S NEW FAMILY OF GEOSTATIONARY ENVIRONMENTAL SATELLITES. UNDER THE CONTRACT, GENERAL DYNAMICS WILL DESIGN, BUILD, AND LAUNCH THE THREE NEW GOES WEATHER SATELLITES FOR NOAA.

THIS IS THE GOVERNMENT'S FIRST PROCUREMENT OF COMMERCIAL LAUNCH SERVICES, AND A MAJOR STEP IN THE COMMERCIALIZATION OF SPACE ACTIVITIES.

SIMILAR AGREEMENTS HAVE ALSO BEEN SIGNED WITH McDONNELL DOUGLAS AND MARTIN MARIETTA, AND WE ARE CLOSE TO CONCLUDING NEGOTIATIONS WITH LTV.

ANOTHER SUCH STEP HAS BEEN THE ESTABLISHMENT OF SIXTEEN CENTERS FOR THE COMMERCIAL DEVELOPMENT OF SPACE--NON-PROFIT CONSORTIA OF UNIVERSITIES, INDUSTRIAL CONCERNS AND GOVERNMENT ACTIVITIES THAT FOCUS ON RESEARCH THAT CAN LEAD TO NEW COMMERCIAL SPACE OPPORTUNITIES.

THERE ARE NOW 106 COMPANIES ASSOCIATED WITH OUR CCDS's. THEY ARE MAKING GOOD PROGRESS, AND WE ANTICIPATE A GROWING PRIVATE SECTOR DEMAND FOR ACCESS TO SPACE AS A RESULT OF THEIR EFFORTS.

OUT OF THOSE CCDS's HAS COME ANOTHER ENTITY CALLED A JOINT ENDEAVOR AGREEMENT OR JEA, UNDER WHICH THE PRIVATE SECTOR PROVIDES THE HARDWARE FOR AN EXPERIMENT, WE FLY IT, AND BOTH PARTIES SHARE THE RESEARCH RESULTS. WE CURRENTLY HAVE SUCH AGREEMENTS WITH SEVEN COMPANIES AND ARE NEGOTIATING OTHERS.

ANOTHER ON-GOING PROGRAM THAT IS PROVING INCREASINGLY SUCCESSFUL IS THE DISSEMINATION AND APPLICATION OF NEW AND INNOVATIVE AEROSPACE TECHNOLOGIES TO PRIVATE SECTOR USERS. CIRCULATION OF OUR NASA TECH BRIEFS, BY WHICH THOSE TECHNOLOGIES ARE DISSEMINATED, HAS RECENTLY DOUBLED FROM 75,000 TO OVER 150,000 INDUSTRIAL AND BUSINESS SUBSCRIBERS. REPORTS FROM READERS INDICATE THAT SAVINGS FROM THE USE OF THIS INFORMATION RUNS INTO MILLIONS OF DOLLARS. RESPONDING TO THIS DOUBLING OF INTEREST, BEGINNING NEXT YEAR WE WILL BE INCREASING THE ISSUE OF THE TECH BRIEFS FROM TEN TO TWELVE A YEAR.

AND, IN A KIND OF DOUBLING UP OF COMMERCIALIZATION, THE ISSUE AND PUBLICATION OF TECH BRIEFS HAS ITSELF BEEN PRIVATIZED, AND IS NOW BEING DONE UNDER CONTRACT BY THE PRIVATE SECTOR.

WITH THE PROMULGATION OF THE PRESIDENT'S NATIONAL SPACE POLICY AND ITS COMMERCIAL SPACE INITIATIVE EARLY THIS YEAR, WE HAVE EXPANDED OUR EFFORTS ALONG THREE SPECIFIC LINES.

FIRST, IN REACTION TO ONE OF THE RECOMMENDATIONS OF THE COMMERCIAL SPACE INITIATIVE, LAST SPRING WE INVITED THE PRIVATE SECTOR TO EXPRESS INTEREST IN THE COMMERCIAL USE OF THE SHUTTLE'S EXPENDED EXTERNAL TANKS, WHICH, AS YOU KNOW, ARE NOW JETTISONED INTO A SUBORBITAL TRAJECTORY THAT TERMINATES IN A SAFE AREA, NORMALLY THE INDIAN OCEAN. A FEASIBLE USE FOR THOSE TANKS WOULD HELP TO PROMOTE A STRONG U.S. COMMERCIAL PRESENCE IN SPACE.

SECOND, WE HAVE MANIFESTED THE PRIVATELY DEVELOPED, OWNED AND MANAGED SPACEHAB FOR SHUTTLE MISSIONS IN 1991 AND 1992. SPACEHAB IS A MODULE DESIGNED TO FIT INTO THE ORBITER'S CARGO BAY FOR THE CONDUCT OF MICROGRAVITY EXPERIMENTS, AND WILL STRONGLY REINFORCE OUR EFFORTS IN SPACE SCIENCE. AN AGREEMENT WITH SPACEHAB'S OWNERS HAS RECENTLY BEEN SIGNED.

FINALLY, WE ARE REVISING GUIDELINES FOR THE COMMERCIAL USES OF THE FREEDOM SPACE STATION IN ORDER TO CLARIFY AND ENHANCE PRIVATE SECTOR INVESTMENT IN THE STATION IN THE PRESENT AND THE FUTURE.

AND, TO PROVIDE US WITH THE EXPERTISE GENERALLY LACKING IN GOVERNMENT IN THE AREAS OF BUSINESS AND FINANCIAL JUDGMENT, WE HAVE FORMED A COMMERCIAL DEVELOPMENT INDUSTRY ADVISORY GROUP OF PRESENT OR FORMER CEO'S OF MAJOR CORPORATIONS. WE HAVE HIGH HOPES THAT THIS DISTINGUISHED GROUP OF VOLUNTEERS WILL HELP US FIND NEW WAYS TO ENCOURAGE PRIVATE SECTOR PARTNERSHIP IN SPACE. I AM PERSONALLY A FIRM AND ENTHUSIASTIC SUPPORTER OF THIS HIGHLY QUALIFIED ADVISORY GROUP, AND MOST APPRECIATIVE OF THEIR DONATION OF WHAT CAN LITERALLY BE DESCRIBED AS "QUALITY TIME".

I HOPE ALL OF THIS HAS LEFT YOU WITH AN INCREASED UNDERSTANDING OF WHAT THE GOVERNMENT/INDUSTRY AEROSPACE TEAM IS DOING, ITS EFFECTS ON OUR NATIONAL LIFE, THE IMPORTANCE OF PRIVATE SECTOR INVOLVEMENT IN SPACE ACTIVITIES, OF THE LITERALLY UNLIMITED OPPORTUNITIES THAT EXIST OUT THERE, AND OF THE STEPS WE ARE TAKING TO ENCOURAGE AND ASSIST SUCH INVOLVEMENT. AS GRADUATES OF A DISTINGUISHED BUSINESS INSTITUTION, AS BUSINESS MEN AND WOMEN, AND AS CIVIC LEADERS, IT IS IMPORTANT THAT YOU BE INFORMED IN A FIELD THAT HOLDS SUCH GREAT PROMISE FOR THE FUTURE.

I INVITE YOUR QUESTIONS.